

REMARKS

Claims 26-34 are presented for consideration. Claims 26, 29 and 32 are the independent claims.

All of the claims, *i.e.*, 26-34, stand rejected under 35 U.S.C. § 103 as allegedly being obvious over Kurihara et al. '478 in view of Glatt '041.

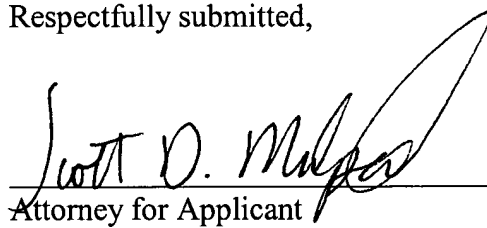
Without conceding the propriety of this rejection, Applicant is hereby submitting a sworn English translation of Japanese priority document 7-052519, filed March 13, 1995. In accordance with 35 U.S.C. § 119, the subject priority document pre-dates the U.S. filing date of Kurihara et al. (February 16, 1996), and it is therefore submitted that Kurihara et al. should be removed as a reference.

Accordingly, reconsideration and withdrawal of the rejection of the claims under 35 U.S.C. § 103 is deemed to be in order and such action is respectfully requested.

In view of the foregoing, reconsideration and allowance of this application is respectfully requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Scott D. Malpede", is written over a horizontal line.

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DECLARATION

I, NOBUAKI KATO, a Japanese Patent Attorney registered No. 8617, of Okabe International Patent Office at No. 602, Fuji Bldg., 2-5, Marunouchi 2-chome, Chiyoda-ku, Tokyo, Japan, hereby declare that I have a thorough knowledge of Japanese and English languages, and that the attached pages contain a correct translation into English of the priority document of Japanese Patent Application No. 7-052519 filed on March 13, 1995 in the name of CANON KABUSHIKI KAISHA.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made, are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed this 9th day of April, 2004



NOBUAKI KATO

PATENT OFFICE
JAPANESE GOVERNMENT

This is to certify that the annexed is a true copy of the following
application as filed with this Office.

Date of Application: March 13, 1995

Application Number: Japanese Patent Application
No. 7-052519

Applicant(s): CANON KABUSHIKI KAISHA

April 19, 1996

Commissioner,
Japan Patent Office

YUJI KIYOKAWA

(Seal)

Certificate No. 08-8020706

7-052519

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[Reference No.] 2954036
[Date] March 13, 1995
[Addressed to] AKIRA TAKASHIMA
Commissioner of the Patent Office
[International Classification] H04N 5/00
[Title of the Invention] Image Input Apparatus
[Number of the Claims] 6
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03-3758-2111

[Indication of Official Fee]

[Way of Payment]

Prepaid

[Prepayment Ledger No.] 011224

[Amount]

21,000

[List of Filed Materials]

[Material]

Specification 1

[Material]

Drawings 1

[Material]

Abstract 1

[General Power of Attorney]

9002707

[Proof Requirement]

Required

[Document Name] Specification

[Title of the Invention] Image input apparatus

[Claims]

[Claim 1] An image input apparatus comprising an original support and image pickup means for picking up an object placed on the original support and being capable of displaying an object image picked up by said image pickup means on a display apparatus,

characterized by

storage means for storing a plurality of images picked up by said image pickup means, and

control means for causing said display apparatus to display a predetermined number of images among the plurality of images stored in said storage means, as an image group.

[Claim 2] An image input apparatus according to claim 1, further comprising:

supporting means for supporting said image pickup means in a first state allowing to pick up an image of an object on the original support and in a second state allowing to pick up an object at the position other than the original support; and

instructing means for instructing to store an image picked up by said image pickup means in the first state of said image pickup means,

wherein said control means controls to display a predetermined number of images on said display device as an image group in the second state of said image pickup means.

[Claim 3] An image input apparatus according to claim 1 or 2, further comprising selecting means for selecting one of images of the image group displayed on said display device.

[Claim 4] An image input apparatus according to claim 3, wherein said control means controls to display an image selected by said selecting means on said display device, in a scale magnified more than the image in the image

group.

[Claim 5] An image input apparatus according to claim 1 or 2, wherein said control means controls to display an image group stored before the currently displayed image, in place of the currently displayed image.

[Claim 6] An image input apparatus according to claim 1 or 2, further comprising adding means for adding an identification signal to an image stored in said storage means.

[Detailed Description of the Invention]

[0001]

[Industrial Utilization Field]

The present invention relates to an image input apparatus capable of picking up an image of an object such as a drawing and displaying the object image on an external display device.

[0002]

[Prior Art]

An image input apparatus is known which picks up an image of an object such as a drawing and displaying the object image on an external monitor or an external screen by using a projector or the like. Such an image input apparatus is not always required to use a transparent original as in the case of an optical overhead projector (OHP), but it can use an opaque original, a document, or the like and is suitable for presentation or the like.

[0003]

[Subject to be solved by the Invention]

However, some conventional image input apparatuses have only a function of displaying a picked-up image, and do not effectively use an image once picked up.

[0004]

Under the above circumstances, the present invention aims to provide an image input apparatus capable of improving versatility of the apparatus for presentation or other purposes, by effectively using an image once picked up.

[0005]

[Means for solving the Subject]

In order to solve the subject of the prior art and attain the above-described objective, an image input apparatus of the present invention comprising an original support and image pickup means for picking up an object placed on the original support and being capable of displaying an

object image picked up by the image pickup means on a display apparatus, is arranged to include storage means for storing a plurality of images picked up by the image pickup means, and control means for causing the display apparatus to display a predetermined number of images among the plurality of images stored in the storage means, as an image group.

[0006]

In the image input apparatus of the present invention, it further includes supporting means for supporting the image pickup means in a first state allowing to pick up an image of an object on the original support and in a second state allowing to pick up an object at the position other than the original support, and instructing means for instructing to store an image picked up by the image pickup means in the first state of the image pickup means, wherein the control means controls to display a predetermined number of images on the display device as an image group in the second state of the image pickup means.

[0007]

Still in the image input apparatus of the present invention, it further includes selecting means for selecting one of images of the image group displayed on the display device, wherein the control means controls to display an image selected by the selecting means on said display device, in a scale magnified more than the image in the image group.

[0008]

Still in the image input apparatus of the present invention, the control means controls to display an image group stored before the currently displayed image, in place of the currently displayed image.

[0009]

Still in the image input apparatus of the present invention, it further includes adding means for adding an identification signal to an image stored in the storage means.

[0010]

[Embodiments]

An embodiment of an image input system of this invention will be described with reference to the accompanying drawings.

[0011]

Fig. 1 is a block diagram of an image input apparatus of the image input system according to the embodiment of the invention. Fig. 2 is a perspective view of the image input apparatus.

[0012]

An image input apparatus 1 has an image pickup unit 20 for picking up an image of a document 200a placed on an original support (base) 25. An image signal of the document 200a photoelectrically converted by the image pickup unit 20 is supplied to an image processing circuit 30 which processes the image signal to control the amplitude, white balance, and frequency characteristics. The image signal outputted from the image processing circuit 30 is temporarily stored in an image memory 40 in response to a trigger signal from a controller 10 via a memory controller 45, which trigger signal is outputted when a drawing side (LOW) of an angle lock switch 90s for detecting a change in the image pickup direction is changed to a portrait side (HIGH). The angle lock switch 90a outputs a signal to a capture control unit 17, the signal changing between HIGH and LOW each time the image pickup direction of the image pickup unit 20 is turned to the portrait side or drawing side.

[0013]

The image signal temporarily stored in the image memory 40 is stored in an image memory 41 in the drawing mode, and stored in an image memory 42 in the portrait mode. In response to a signal from the controller 10, the memory controller 45 operates to store the image signal in the image memory 40 either into the image memory 41 or 42, and the image signal stored in the image memory 41 or 42 into the image memory 40.

[0014]

In response to a depression of a capture switch 15 and a signal outputted therefrom, the capture control unit 17 issues a command to the controller 10 to store the image signal from the image processing circuit 30 in

the image memory 40, so that the object image picked up by the image pickup unit 20 is temporarily stored in the image memory 40.

[0015]

The image input apparatus 1 has a character generator 12 which outputs a character signal in response to a control signal from the controller 10. A character signal from the character generator 12 and an image signal from the image memory 40 are added together by an addition circuit 13, the added signal being outputted from an external output terminal 55 for an external monitor 5 (refer to Figs. 4 and 5) and/or an internal monitor output terminal 56 for an internal monitor 3 (refer to Fig. 2). The external output terminal 55 and internal monitor output terminal 56 are connected via a switch 50 to the addition circuit 13 and image processing circuit 30. In response to a signal from the controller 10, the switch 50 selects an input signal either from the addition circuit 13 or from the image processing circuit 30, and outputs the selected signal either to the external output terminal 55 or the internal monitor output terminal 56, or to both of them. With the internal monitor 3, an operator can check conveniently the display contents of the external monitor 5 without directly looking at the external monitor 5.

[0016]

The image input apparatus 1 has a light 70 for illuminating the original support 25 and the document 200a placed thereon. Power is supplied to this light 70 via a switch circuit 60 operated in response to an external switch 60a. Depending upon a selected contact, the switch circuit 60 operates to always turn the light 70 (contact a) on, to automatically turn it on only during the drawing mode (contact b), or to always turn it off (contact c). The switch circuit 60 has another switch 65 which is turned on or off in response to a control signal from the controller 10. With this switch 65 being turned on, the contact b becomes active.

[0017]

The controller 10 is connected to a memory 80 which stores various setting constants of the image input apparatus 1. The image input apparatus 1 is also provided with a power source plug 101 and a power switch 102.

[0018]

Next, an operation panel 200 (Fig. 2) will be described with reference to Fig. 8.

[0019]

The operation panel 200 has display LEDs including LEDs 201, 205, and 206. The LED 201 indicates a power-on upon turning on the power switch 102. The LED 205 indicates an automatic trace mode of white balance or automatic white balance mode. The LED 206 indicates a white balance fixed mode.

[0020]

The operation panel 200 has image selection switches including switches 210 and 211. The switch 210 is used for selecting an image signal outputted from the image pickup unit 20 and has an LED which turns on when the switch selects it. The switch 211 is used for selecting an image signal stored in the image memory 40 (image memories 41 and 42) and has an LED which turns on when the switch selects it.

[0021]

The operation panel 200 has other image display pattern selection switches including switches 212 and 213. The switch 212 is used for selecting a display of a single image, and has an LED which turns on when the switch selects it. The switch 213 is used for selecting a display of an image group of multi-image represented by an image signal containing a predetermined number of images.

[0022]

The operation panel 200 has other multi-image group selection switches including switches 214 and 220. The switch 214 is used for selecting a display of a predetermined number of images (image group) stored before the presently displayed image group of multi-image, and has an LED which turns on when the switch selects it. The switch 220 is used for selecting a display of a predetermined image group stored after the presently displayed image group of multi-image, and has an LED which

turns on when the switch selects it.

[0028]

The operation panel 200 also has switches for selecting one image from the image group, including UP, LEFT, RIGHT, and DOWN switches. The UP switch 215 is used for selecting an image in the image group in the up-direction from the image presently indicated by a cursor. The LEFT switch 216 is used for selecting an image in the image group in the left-direction from the image presently indicated by a cursor. The RIGHT switch 218 is used for selecting an image in the image group in the right-direction from the image presently indicated by a cursor. The DOWN switch 219 is used for selecting an image in the image group in the down-direction from the image presently indicated by a cursor. An image selected by the cursor moved by these switches 215, 216, 218, and 219 can be displayed as a full-screen image by a SELECT switch 217. The full-screen image can be deleted from the monitor screen by an ERASE switch 221. The operation panel 200 also has the capture switch 15 described above.

[0024]

Next, the operation of the image input system will be described. An operator inserts the power source plug 101 (Fig. 1) into an unrepresented receptacle of a commercial power source and turns the power switch 102 on, in order to use the image input apparatus 1 as a drawing camera for picking up an image of an object placed on the original support 25.

[0025]

The conditions before the power is turned on are as follows. The image pickup unit 20 is fixed at a predetermined position before the power switch 102 is turned on in order to use it at first as a drawing camera, because the rotation of a rotary shaft unit 2 is locked by an angle lock button 90. Therefore, the angle lock switch 90a is in a conductive state. The contact b of the switch 60 is also in a conductive state.

[0026]

When the power switch 102 is turned on and the controller 10 is activated, the controller 10 judges from an H level voltage supplied from the

angle lock switch 90a that the angle lock switch 90a is in the drawing mode and is in the lock state. The controller 10 reads white balance control data of the drawing mode previously stored in the memory 80, and supplies it to the image processing circuit 30 in order to set the white balance to the drawing mode. In this case, a white balance lock signal of an H level is supplied to the LED 206 to turn it on for an indication that the white balance is being locked. Since the angle lock switch 90a outputs the H level, the controller 10 closes the switch 65 so that the light 70 is powered and turned on.

[0027]

Under the above conditions, an operator can speak while picking up the image of the document 200a, and a necessary document is stored in the image memory 40 by depressing the capture switch 15. A trigger signal inputted from the capture switch 15 is supplied to the capture control unit 17. In response to this trigger signal, the capture control unit 17 supplies the controller 10 with a signal instructing to temporarily store the image signal in the image memory 40 as the drawing image signal. In response to this signal, the controller 10 operates to temporarily store the image signal outputted from the image processing circuit 30 in the memory 40. Since an output from the angle lock switch 90a indicates that the image pickup unit 20 is in the drawing mode, the image signal is stored in the image memory 41 for storing the image during the drawing mode.

[0028]

It is assumed here that the operator stops picking up the image of the document 200a and manipulates the angle lock switch 90 in order to change the angle of the image pickup unit 20 to use it as a portrait camera and receive questions from participants. In this state since the angle lock switch 90a is released and enters in an open state, an output signal from the angle lock switch 90a changes to a preset voltage value determined by resistors R1 and R2. The capture control unit 17 detects from this change in the output signal of the angle lock switch 90a that the image pickup unit 20 has been released from the drawing mode. The capture control unit 17 then outputs a signal indicating this change to the controller 10. Upon reception of the signal indicating a release from the drawing mode, the

controller 10 supplies a signal to the memory controller 45 in order for the memory controller 45 to operate to temporarily store the output signal from the image processing circuit 30 in the image memory 40. The memory controller 45 therefore temporarily stores the output signal from the image processing circuit 30 in the image memory 40. While the drawing mode transits to the portrait mode, an image stored in the image memory 40 is outputted via the addition circuit 13 and switch 50 to the external monitor 5. Therefore it becomes possible to inhibit a display of the image while the image pickup unit 20 moves. Thereafter, as the operator fixes the angle lock button 90 with the image pickup unit 20 being directed to a questioner, the output signal of the angle lock switch 90a changes to a Low level so that the portrait mode can be detected. Upon this detection of the portrait mode, the controller 10 switches the outputs of the output terminals 55 and 56 from an output of the memory 40 to the output of the image pickup unit 20. The controller 10 also outputs a signal to the switch circuit 60 to release the switch 65 and turn off the light 70. The controller 10 also releases the white balance lock to enter a white balance state. At this time, the LED 206 indicating the white balance lock is turned off and the LED 205 indicating a white balance mode is turned on.

[0029]

If a questioner asks about data displayed immediately before transition from the portrait mode, the operator selects the memory image output selection switch 211 so that the controller 10 changes the contact state of the switch 50 to output signal from the addition circuit 13. In this case, since the signal to be inputted to the addition circuit 13 is a signal stored when the angle lock switch 90a was released immediately before the image pickup unit 20 was changed to the portrait mode, i.e., the image of data last discussed, the operator merely selects the memory image output selection switch 211.

[0030]

If a questioner asks about data discussed previously, the operator selects the multi-image selection switch 213. When an image group of multi-image is selected, the controller 10 reads in a skip-manner images, for example, nine images sequentially stored in the memory 41, forms a single

image group of multi-image on the memory 40, and outputs it to the addition circuit 18. The controller 10 also operates to output character signals of the image serial numbers of images of multi-image from the character generator 12. The addition circuit 13 adds the character signals to the multi-image signal and outputs the result to the switch 50. Under the control of the controller 10, the switch 50 selects a signal from the addition circuit 13 and outputs it to display the multi-image of data presented during discussion.

[0031]

Display examples will be described with reference to Figs. 4 and 5.

[0032]

Figs. 4(a) and (b) show multi-image displays on the monitor screen. As seen from Figs. 4(a) and (b), each image group of multi-image has nine images and the image No. 5 is being selected. In Fig. 4(a) the image No. 5 is discriminated by using a bold frame, and in Fig. 4(b) it is discriminated by using a bar under the numerical character 5.

[0033]

It is possible for the operator (lecturer) to select any one of images which the questioner wishes to ask about and display it again on the full screen of the monitor, in the following manner. A cursor (in this embodiment, a bold frame or bar) is moved to the desired image by using the switches 215, 216, 218, and 219 and the selection switch 217 is depressed. This operation will be detailed with reference to Fig. 5. When an image group of multi-image is selected by the switch 213 (Fig. 3), images with the serial numbers being superimposed are displayed and at the initial state the image No. 1 is being selected (in this example, with a bold frame), as shown in Fig. 5(a). When the switch 218 is depressed next, the selected image changes to the image No. 2 as shown in Fig. 5(b). When the switch 219 is depressed next, the selected image changes to the image No. 5 as shown in Fig. 5(c). When the selection switch 217 is depressed next, the image No. 5 selected as shown in Fig. 5(c) is displayed on the full screen of the monitor 5 as shown in Fig. 5(d).

[0034]

If there are a number of document sheets used and the desired image is not found in the displayed image group of multi-image, the preceding image group is displayed by using the switch 214 to select the desired image in the manner described above. If characters in the selected image are too small to distinguish, part of the image may be zoomed up. This zoom-up can be achieved by partially enlarging the image stored in the memory. If characters are still small with this zoom-up, then the document 200a is again placed on the original support 25 and zoomed up by using the optical system of the image pickup unit 20.

[0085]

If the displayed image is to be deleted, the switch 221 is depressed. In this embodiment, although the displayed image only is deleted, the image data stored in the image memory 41 may also be deleted in response to the operation of deleting the displayed image. If an unnecessary image stored in the memory is to be deleted, an image group of multi-image is displayed, the unnecessary image is displayed on the full screen of the monitor, and after the confirmation it is deleted by depressing the switch 221. In this manner, even images picked up under unsatisfactory pickup conditions can be easily deleted.

[0086]

If the image memory 40 is divided into storage areas for a single image area and a multi-image area, switching between single images and images of multi-image can be performed at high speed by the memory controller 45 which operates in response to a signal from the controller 10 receiving a selection signal from the switch 212 or 213 of the operation panel to selectively output the images stored in these areas.

[0037]

In the above description, although two memories are used for the drawing and portrait modes, a single image memory capable of storing a plurality of images may be used. In this case, while an image signal is stored, identification data for the image signal is stored in the memory 80 or memory controller 45 so that an image signal of the portrait mode or drawing mode can be discriminated from the identification data. Therefore, only the

image signals stored in the drawing modes can be selected to display an image group of multi-image.

[0038]

As described so far, if the image input apparatus of this embodiment is applied to a system such as a presentation system, data once discussed can be displayed again easily so that discussion with questioners can be smoothly promoted.

[0039]

The images of questioners can also be stored in a different memory block by using the image pickup unit of the embodiment apparatus as a portrait camera. Therefore, the portrait image is not prevented from being inadvertently displayed during presentation. The portrait images may be used when reports are formed after the presentation.

[0040]

[Technical Effects of the Invention]

As apparent from the explanation described above, the following advantages can be provided in accordance with the image input apparatus recited in the claims.

[0041]

According to the image input apparatus recited in claim 1, a plurality of objects such as documents picked up can be stored and an image group of multi-image having a predetermined number of images can be displayed on a monitor. Therefore, data asked about by a questioner during presentation or the like can be easily selected, facilitating the promotion of communications between lectures and questioners.

[0042]

According to the image input apparatus recited in claim 2, while an object other than on the original support is being picked up, an image group of objects on the original support picked up previously can be displayed. Therefore, the first advantage can be enhanced more.

[0043]

According to the image input apparatus recited in claim 3, since selecting means for selecting one of images of an image group displayed on the display device is provided, the image can be displayed on the full screen of a display unit.

[0044]

According to the image input apparatus recited in claim 4, controlling means controls to display a signal image of an image group of multi-image selected by the selecting means on the full screen of the display device. Therefore, the contents of document data displayed can be clearly confirmed to help ask an exact question.

[0045]

According to the image input apparatus recited in claim 5, the controlling means can control to display another image group stored previously in place of a currently displayed image group. Therefore, even if a desired image cannot be found in the displayed image group, other image groups can be sequentially displayed to find the desired image.

[0046]

According to the image input apparatus recited in claim 6, adding means is provided for adding an identification code to an image stored in storing means. Therefore, an image of desired document data can be designated at once.

[Brief Explanation of the Drawings]

[Fig. 1] A block diagram of an image input apparatus of an image input system according to an embodiment of the invention.

[Fig. 2] A perspective view of the image input apparatus shown in Fig. 1.

[Fig. 3] A diagram showing an operation panel of the image input apparatus.

[Fig. 4] A diagram showing examples of images displayed on a monitor.

[Fig. 5] A diagram showing other examples of images displayed on a monitor.

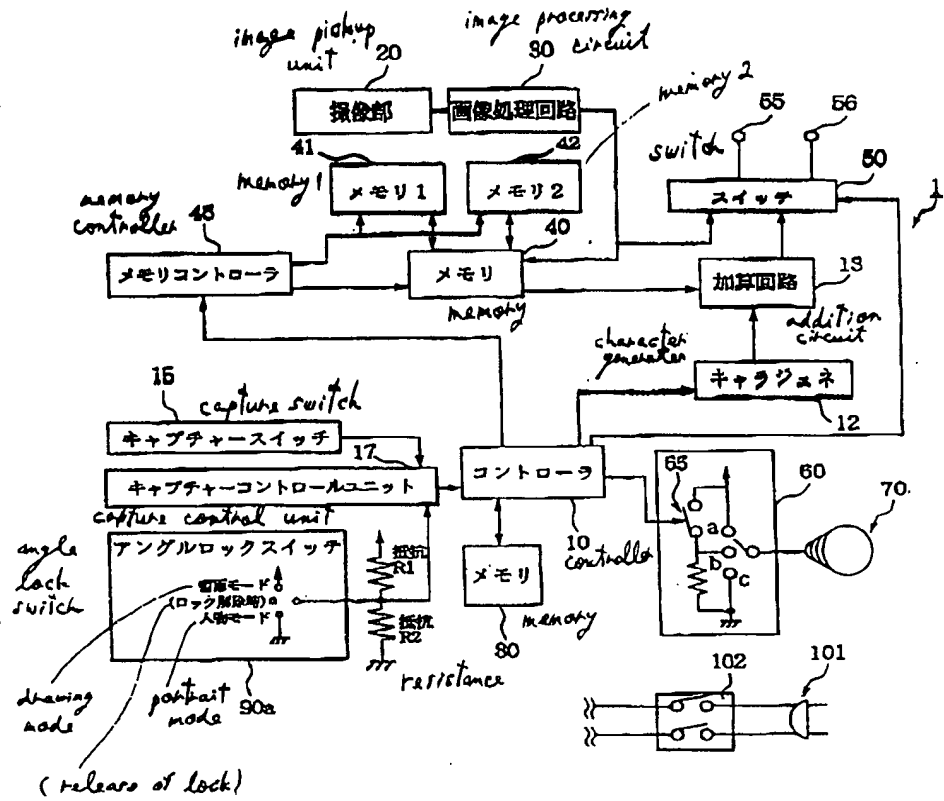
[Explanation of Reference Numerals]

10	controller
20	image pickup unit
25	original support
40	image memory
41	image memory
42	image memory
15	capture switch
213	multi-image display switch

【各図名】 図面

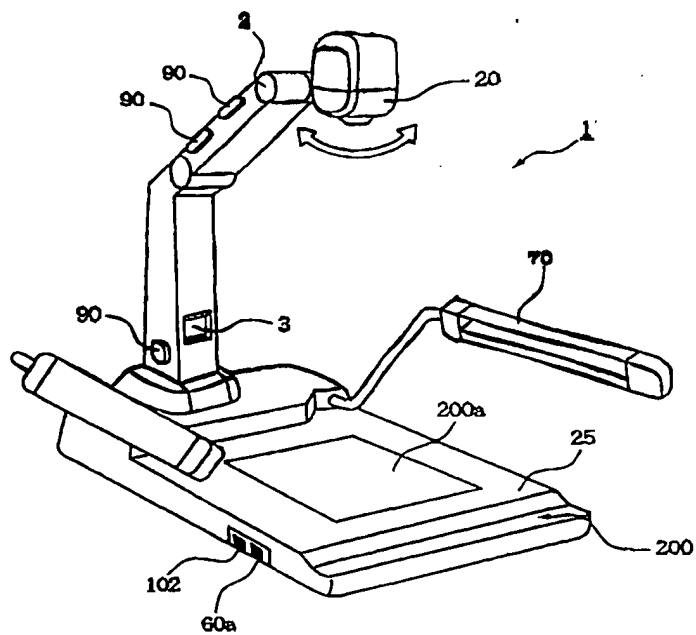
【図1】

Fig. 1



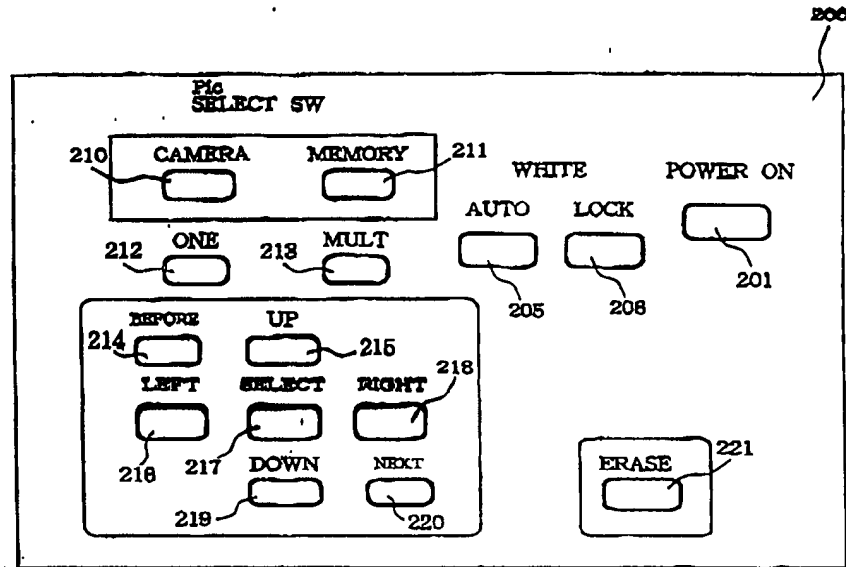
【図2】

Fig. 2



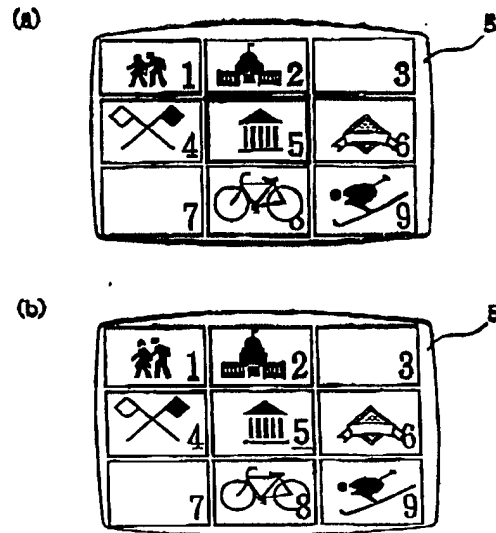
【図8】

Fig. 3



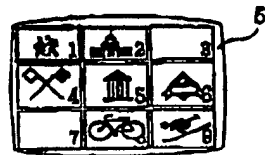
【図4】

Fig. 4

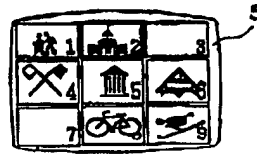


【図 5】

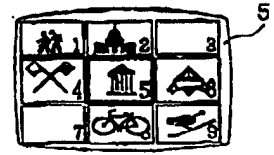
Fig. 5



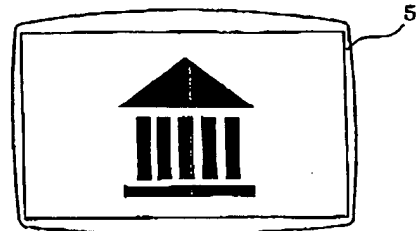
(a)



(b)



(c)



(d)

[Document Name] Abstract

[Summary]

[Objective] To present an image input apparatus which can attain effective use of an image picked up once and thereby improve its convenience for a user who makes presentation or the like.

[Construction] An image input apparatus which comprises an original support and image pickup means 20 for picking up an object placed on the original support and is arranged so as to display an image picked up by the image pickup means 20 on a display apparatus, further comprises storage means 41 arranged to store a plurality of images picked up by the image pickup means 20 and control means 10, 45 for causing the display apparatus to display a predetermined number of images among the plurality of images stored in the storage means, as an image group.

[Selected Figure] Fig. 1

7-052518

[Name of the Document]

Authorized Correction Data

[Document to be Corrected]

Patent Application

<Recognition Information - Additional Information>

[Applicant]

[Identification No.]

000001007

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08-3020706

7-052519

Applicant's Information

Identification No.

[000001007]

1.	Date of Change	August 30, 1990
	[Reason for Change]	New Registration
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